



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION VII
726 MINNESOTA AVENUE
KANSAS CITY, KANSAS 66101

10-2-15
Paul 161031

OCT 31 1986

MEMORANDUM

04-00



161031

Site:	Atlantic Water
ID#:	IAD039954300
State:	Iowa
County:	
City:	
Zip:	10-31-86

SUBJECT: FIT Assistance to Iowa DNR at Atlantic Water Supply Site
(IAD039954300)

FROM: Robert L. Morby, Chief *Kenny Henderson for*
SPFD/WSTM

TO: Charles Hensley
EP&R/ENSV

This memo is to formalize discussions between Iowa DNR and Ron McCutcheon of your staff, as confirmed by Pete Culver of my staff with Mr. McCutcheon on October 31, 1986.

The Iowa DNR's written request and background information is attached. Please keep Pete Culver informed as this investigation proceeds.

Attachment

RECEIVED

NOV 05 1986

E&E K.C.K.



department of water, air and waste management

October 28, 1986

Dr. Pete Culver
Superfund Branch
Environmental Protection Agency
726 Minnesota Avenue
Kansas City, KS 66101

Dear Dr. Culver:

Attached is the preliminary assessment of the Atlantic Water Supply site (identification number IAD039954300).

This site has been assigned a medium priority for inspection because contamination has been observed in two of the city's drinking water wells and the remaining nine wells are in close proximity. The source of contamination has not been identified.

We are requesting assistance from EPA's FIT contractor in identifying possible sources of contamination through soil gas monitoring. The Department is considering purchasing soil gas monitoring equipment. Ideally, this inspection would serve as training in the use of various soil gas monitoring devices prior to procurement.

Thank you for your assistance.

Sincerely,

A handwritten signature in cursive script that reads 'Morris L. Preston'.

MORRIS L. PRESTON
SECTION CHIEF
ABANDONED/UNCONTROLLED SITES SECTION

MLP:JC:pla/AUSW301M08.01

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OCT 30 1986

REMD SECTION



POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 1 - SITE INFORMATION AND ASSESSMENT

I. IDENTIFICATION

01 STATE 02 SITE NUMBER
IA DC399 54300

II. SITE NAME AND LOCATION

NAME (Legal, common, or descriptive name of site) Atlantic Water Supply		02 STREET ROUTE NO. OR SPECIFIC LOCATION IDENTIFIER 15 West Third Street			
03 CITY Atlantic	04 STATE IA	05 ZIP CODE 50022	06 COUNTY Cass (15)	07 COUNTY CODE	08 CONG DIST
09 COORDINATES LATITUDE 41° 24' 30" -		LONGITUDE - 95° 00' -			
10 DIRECTIONS TO SITE (Starting from nearest public road): The water plant is on the east end of third st. in Atlantic. Well #7 is further east on third street - directly south of the RR tracks and Buttermilk creek (drainage ditch) past the road to the power plant (Pine St). See map					

III. RESPONSIBLE PARTIES

01 OWNER (if known) Board of Trustees Atlantic Municipal Waterworks		02 STREET (Business, mailing, residential) 15 West Third St.			
03 CITY Atlantic	04 STATE IA	05 ZIP CODE 50022	06 TELEPHONE NUMBER ()		
07 OPERATOR (if known and different from owner) Mr. Wilbert Hock Water Superintendent		08 STREET (Business, mailing, residential) 15 West Third St.			
09 CITY Atlantic	10 STATE IA	11 ZIP CODE 50022	12 TELEPHONE NUMBER ()		
13 TYPE OF OWNERSHIP (Check one) <input type="checkbox"/> A. PRIVATE <input type="checkbox"/> B. FEDERAL: _____ (Agency name) <input type="checkbox"/> C. STATE <input type="checkbox"/> D. COUNTY <input checked="" type="checkbox"/> E. MUNICIPAL <input type="checkbox"/> F. OTHER: _____ (Specify) <input type="checkbox"/> G. UNKNOWN					

OWNER/OPERATOR NOTIFICATION ON FILE (Check all that apply):

☒ RCRA 3001 DATE RECEIVED: _____ MONTH DAY YEAR ☐ B UNCONTROLLED WASTE SITE (RCRA 103 c) DATE RECEIVED: _____ MONTH DAY YEAR ☒ C NONE

IV. CHARACTERIZATION OF POTENTIAL HAZARD

01 ON SITE INSPECTION <input type="checkbox"/> YES DATE: _____ MONTH DAY YEAR <input checked="" type="checkbox"/> NO		BY (Check all that apply): <input type="checkbox"/> A. EPA <input type="checkbox"/> B. EPA CONTRACTOR <input type="checkbox"/> C. STATE <input type="checkbox"/> D. OTHER CONTRACTOR <input type="checkbox"/> E. LOCAL HEALTH OFFICIAL <input type="checkbox"/> F. OTHER: _____ (Specify) CONTRACTOR NAME(S): _____			
02 SITE STATUS (Check one) <input checked="" type="checkbox"/> A. ACTIVE <input type="checkbox"/> B. INACTIVE <input type="checkbox"/> C. UNKNOWN		03 YEARS OF OPERATION BEGINNING YEAR: _____ ENDING YEAR: _____ <input checked="" type="checkbox"/> UNKNOWN			
04 DESCRIPTION OF SUBSTANCES POSSIBLY PRESENT, KNOWN, OR ALLEGED Well #7 has shown contamination with ~ 200ppb Tetrachloroethene. Well #3 has also shown some PCE (~4ppb). The source of the contamination is unknown. These wells are not presently being used as supply. Well 7 is pumped to waste.					
05 DESCRIPTION OF POTENTIAL HAZARD TO ENVIRONMENT AND/OR POPULATION All the wells are in the same aquifer in close proximity to each other. Finished water contains ~1ppb PCE.					

V. PRIORITY ASSESSMENT

01 PRIORITY FOR INSPECTION (Check one. If high or medium is checked, complete Part 2 - Waste Information and Part 3 - Description of Hazardous Conditions and Incidents): <input type="checkbox"/> A. HIGH (Inspection required promptly) <input checked="" type="checkbox"/> B. MEDIUM (Inspection required) <input type="checkbox"/> C. LOW (Inspect on time available basis) <input type="checkbox"/> D. NONE (No further action needed, complete current disposition form)			
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VI. INFORMATION AVAILABLE FROM

01 CONTACT	02 OF (Agency Organization)		03 TELEPHONE NUMBER ()	
04 PERSON RESPONSIBLE FOR ASSESSMENT Jan Carleton	05 AGENCY IDNR	06 ORGANIZATION	07 TELEPHONE NUMBER 1515 251-7040	08 DATE 10 / 15 / 86 MONTH DAY YEAR



POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT

PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

1. IDENTIFICATION

01 STATE 02 SITE NUMBER

HAZARDOUS CONDITIONS AND INCIDENTS

01 ☐ A GROUNDWATER CONTAMINATION 02 ☒ OBSERVED (DATE 7/79) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED 7,789 04 NARRATIVE DESCRIPTION
Population of Atlantic

See attached sample reports. Tetrachloroethene has been observed consistently in well #7 at ~200ppb. Other contaminants observed in #7 have been TCE, Trans 1,2 Dichloroethene, Chloroform and Atrazine. Organic contaminants have also been detected in wells 2, 3, 8, 9 & 12.

01 ☐ B SURFACE WATER CONTAMINATION 02 ☐ OBSERVED (DATE _____) ☒ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED _____ 04 NARRATIVE DESCRIPTION

Water from Well #7 is discharged to Buttermilk Creek (Drainage Ditch) which flows into Troublesome Creek (~850 ft downstream). Troublesome Creek flows into the Nishnabotna River about 1 1/2 miles downstream.

01 ☐ C CONTAMINATION OF AIR 02 ☐ OBSERVED (DATE _____) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED _____ 04 NARRATIVE DESCRIPTION

Source of groundwater contamination is unknown. If the source is on the surface some air contamination is likely because of the volatile nature of tetrachloroethene.

01 ☐ D FIRE/EXPLOSIVE CONDITIONS 02 ☐ OBSERVED (DATE _____) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED _____ 04 NARRATIVE DESCRIPTION

No information to support that fire/explosive conditions are present.

01 ☐ E DIRECT CONTACT 02 ☐ OBSERVED (DATE _____) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED _____ 04 NARRATIVE DESCRIPTION

Above ground source has not been identified. Contact may occur after pumping groundwater to drainage ditch. Water is aerated by falling into the ditch. No odor was observed at this location.

01 ☐ F CONTAMINATION OF SOIL 02 ☐ OBSERVED (DATE _____) ☐ POTENTIAL ☐ ALLEGED
03 AREA POTENTIALLY AFFECTED factory 04 NARRATIVE DESCRIPTION

Above ground source has not been identified. Soil may be contaminated by contact with contaminated water.

01 ☐ G DRINKING WATER CONTAMINATION 02 ☒ OBSERVED (DATE _____) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED 7,789 04 NARRATIVE DESCRIPTION
Population of Atlantic

See #1 above. The finished water has had 1ppb PCE.

01 ☐ H. WORKER EXPOSURE/INJURY 02 ☐ OBSERVED (DATE _____) ☐ POTENTIAL ☐ ALLEGED
03 WORKERS POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

Water plant & power plant employees work near the contaminated wells.

01 ☐ I. POPULATION EXPOSURE/INJURY 02 ☐ OBSERVED (DATE _____) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED _____ 04 NARRATIVE DESCRIPTION

The area is not fenced.



POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT

PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION

01 STATE 02 SITE NUMBER

II. HAZARDOUS CONDITIONS AND INCIDENTS *Continued*

01 ☐ J. DAMAGE TO FLORA
04 NARRATIVE DESCRIPTION

02 ☐ OBSERVED (DATE _____) ☐ POTENTIAL ☐ ALLEGED

None noted near the site or along Buttermilk Creek.
PCE ~~was~~ has not been shown to effect aquatic plants in studies done to date.

01 ☐ K. DAMAGE TO FAUNA
04 NARRATIVE DESCRIPTION (include name(s) of species)

02 ☐ OBSERVED (DATE _____) ☐ POTENTIAL ☐ ALLEGED

PCE can be carried up the food chain, however it does not appear to bio magnify or concentrate as it moves up the food chain. It is generally eliminated rapidly from aquatic organisms.

01 ☐ L. CONTAMINATION OF FOOD CHAIN
04 NARRATIVE DESCRIPTION

02 ☐ OBSERVED (DATE _____) ☐ POTENTIAL ☐ ALLEGED

See above

01 ☐ M. UNSTABLE CONTAINMENT OF WASTES
(Spills/runoff/leaking drums/leaking drums)

02 ☐ OBSERVED (DATE _____) ☐ POTENTIAL ☐ ALLEGED

03 POPULATION POTENTIALLY AFFECTED _____ 04 NARRATIVE DESCRIPTION

None observed to date. Wells are near a power plant which has been operating since the early 1900's. Wastes are likely to be disposed nearby. Well logs contain references to fill-blocks & cinders.
Some

01 ☐ N. DAMAGE TO OFFSITE PROPERTY
04 NARRATIVE DESCRIPTION

02 ☐ OBSERVED (DATE _____) ☐ POTENTIAL ☐ ALLEGED

None observed to date. The city wells are likely to draw any contamination from.

01 ☐ O. CONTAMINATION OF SEWERS, STORM DRAINS, WWTPs
04 NARRATIVE DESCRIPTION

02 ☐ OBSERVED (DATE _____) ☒ POTENTIAL ☐ ALLEGED

There is a potential for contamination of sewers. The sewer runs along the street in front of well #7.
South

01 ☐ P. ILLEGAL/UNAUTHORIZED DUMPING
04 NARRATIVE DESCRIPTION

02 ☐ OBSERVED (DATE _____) ☐ POTENTIAL ☐ ALLEGED

None noted to date.

05 DESCRIPTION OF ANY OTHER KNOWN, POTENTIAL, OR ALLEGED HAZARDS

III. TOTAL POPULATION POTENTIALLY AFFECTED: _____

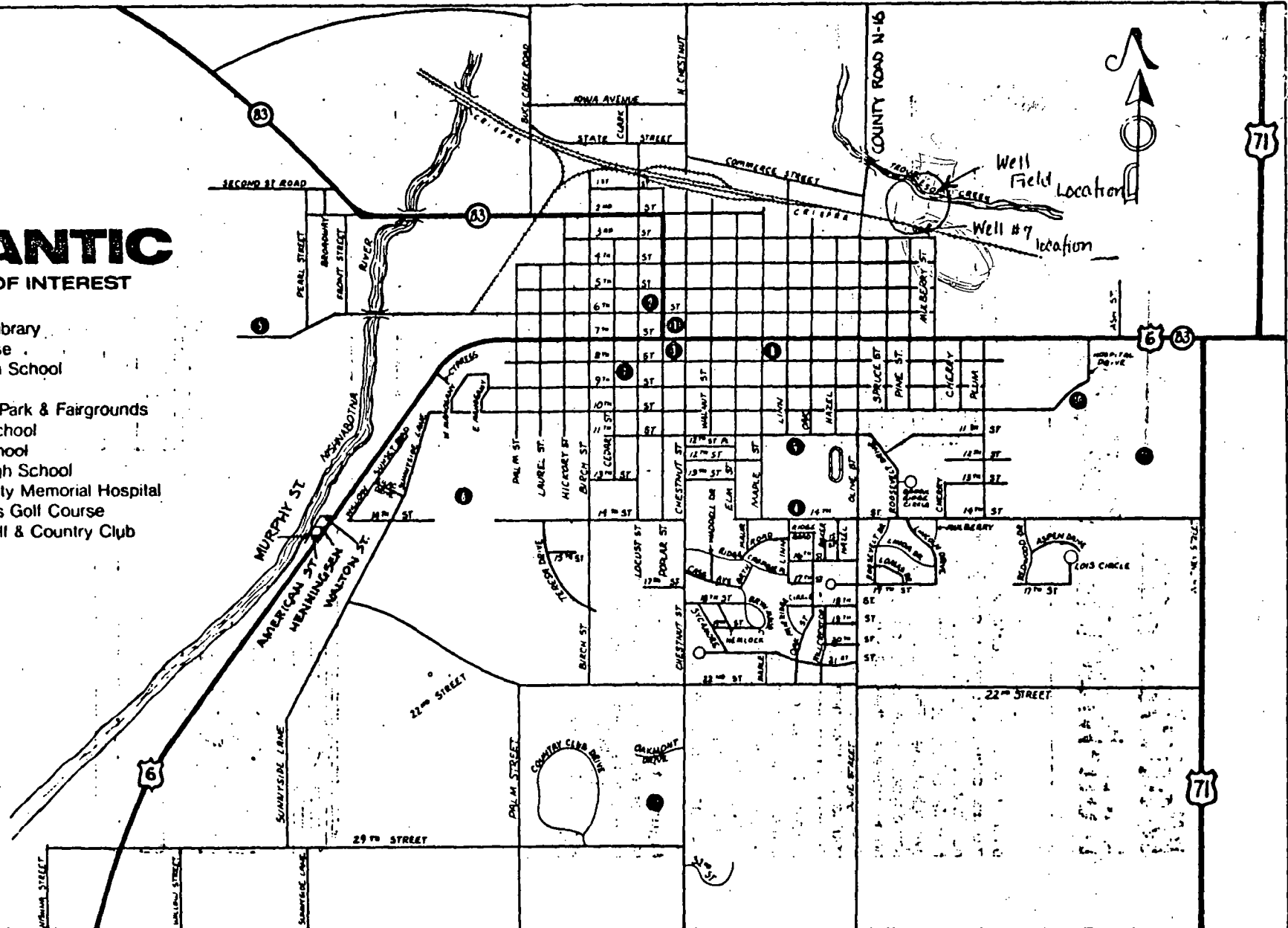
IV. COMMENTS

V. SOURCES OF INFORMATION (See specific references, e.g., state files, laboratory analysis, reports)

ATLANTIC

POINTS OF INTEREST

1. City Park
2. Carnegie Library
3. Court House
4. Washington School
5. Airport
6. Sunnyside Park & Fairgrounds
7. Jackson School
8. Lincoln School
9. Atlantic High School
10. Cass County Memorial Hospital
11. Nishna Hills Golf Course
12. Atlantic Golf & Country Club



WELL LOCATIONS
FOR
WATER WORKS & ELECTRIC LIGHT
POWER PLANT TRUSTEES
(ATLANTIC MUNICIPAL UTILITIES)
ATLANTIC, IOWA

SCALE = 1" = 330'

WELL # 12

WELL # 11

WELL # 10

WELL # 6

WELL # 8

WELL # 9

WELL # 5

WELL # 1

WELL # 4

WELL # 3

WELL # 2

WELL # 7

1.29 AC. (13)

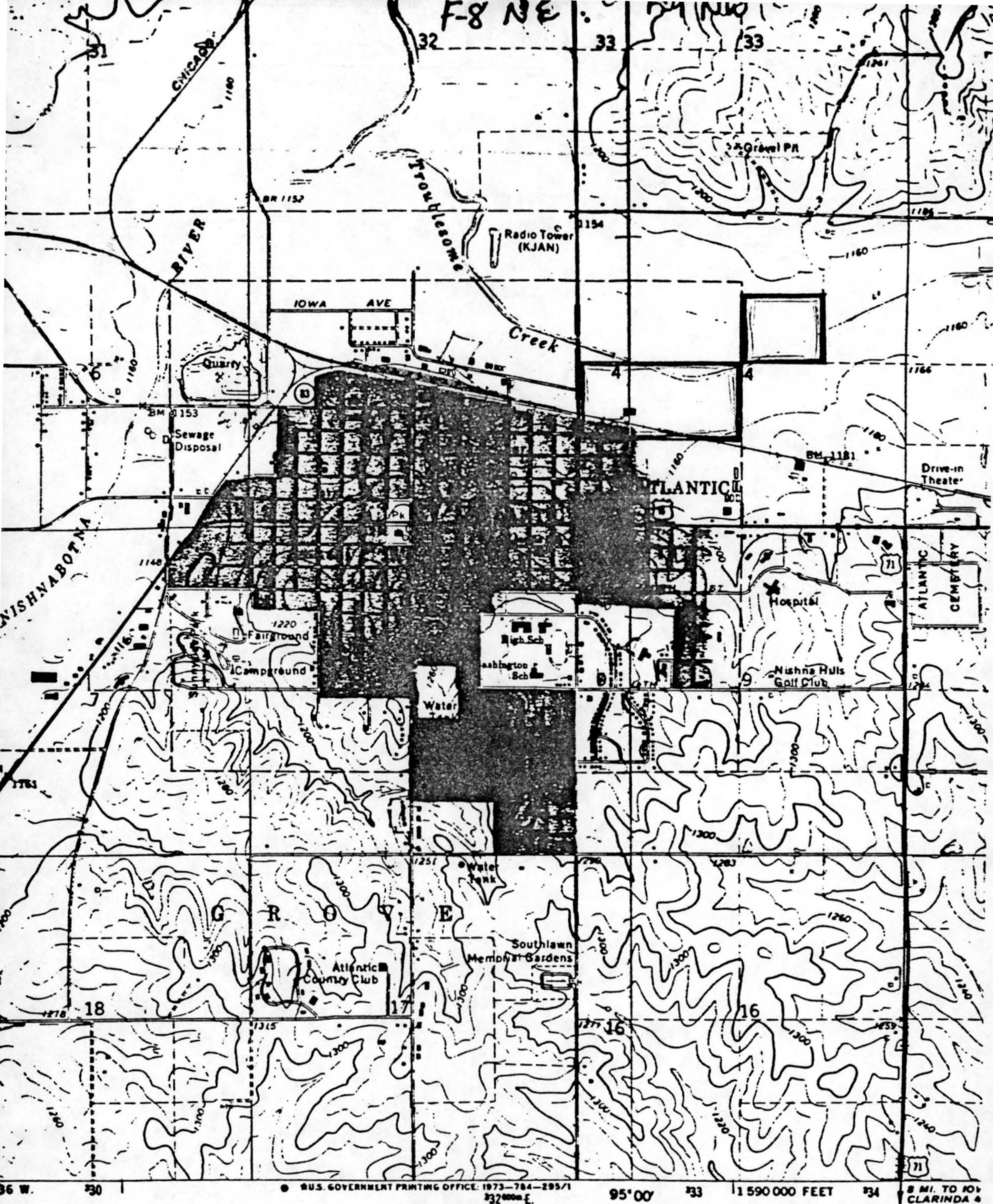
6.63 AC.

25.41 AC.

Fig 2.

☆ - producing well

○ - well not on line



U.S. GOVERNMENT PRINTING OFFICE: 1973-784-295/1
3280000

95° 00' 33 1 590 000 FEET 34 8 MI. TO IOVA CLARINDA 4

ROAD CLASSIFICATION

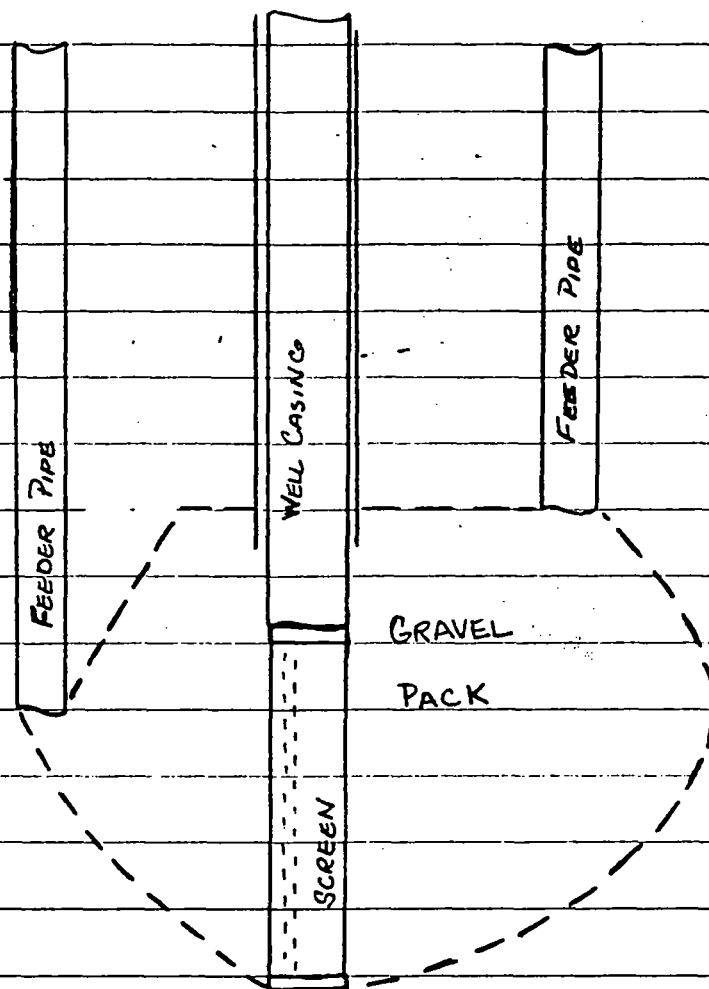
Primary highway, hard surface ————
Light-duty road, hard or improved surface ————

Mapped, edited, and published by the Geologic Control by USGS and USC&GS

Topography by photogrammetric methods from aerial

Figure 1

FIGURE THREE



WELL WITH FEEDER PIPES

The old wells have feeder pipes used to feed gravel to the gravel pack below
~~where~~ The gravel pack needed to be replenished following frequent acidification.

PRELIMINARY ASSESSMENT - ATLANTIC

HISTORY OF SITE

Atlantic began providing water to its residents in the 1880's. Shortly after that time, a power plant was combined with water treatment facilities at the same location. Presently Atlantic uses ~~nine~~ wells along Troublesome Creek in Cass County, Iowa (see figures one & two).

Wells one through four were probably constructed in 1919 using a gravel pack construction method (see figure three). They were between 75 and 90 feet deep completed in the Dakota Sandstone. Well four is connected to the system but is not presently being used. Well 3 was taken off line on ~~10/15/86~~ due to contamination. Well 5 is abandoned and is capped. Well 7 has been off line since 1982 but has been pumped to waste during that time. It is 83 feet deep completed in the Dakota Sandstone with similar construction as described in figure three. Wells 6,8,9,10,11 and 12 were constructed between 1956 and 1977 and do not have gravel feeder lines like the older wells. These wells are also completed in the Dakota Sandstone. Information on well geology and construction is in Appendix One.

Groundwater Contamination

Toxicity. TLV = 100 ppm

Tetrachloroethene was first observed in well 7 on 8/26/82 at 170 ppb. Sample results in 1984 and 1986 have been consistently around 200 ppb except for one sample in January 1986 which was analyzed to contain 1900 ppb Tetrachloroethene. Other contaminants observed in well 7 have been trichloroethene, trans 1,2 dichloroethene, chloroform and atrazine. Organic contamination has also been detected in wells 2,3,8,9 and 12. Sample results are attached in Appendix Two. Wells 3 and 7 have been taken off line due to contamination. From 1982 to January 1986 well 7 was pumped at approximately 80 gallons per minute for 8 to 12 hours per day to Buttermilk Creek (Drainage Ditch). Following the very high sample result in January, 1986, well 7 was shut off for 3 months. It was run for about 3 hours prior to sampling in March, 1986. Since that time well 7 has been pumped to waste for 24 hours per day. Well logs indicate a layer of clay about 15 feet thick above a thin gravel layer which overlies the sandstone.

Possible Contaminant Sources

The source of contamination has not been identified. Some possible sources of contamination are listed below.

1. Power Plant

It is likely that the power plant had a disposal area on site. The well logs for wells 3 and 5 note layers of fill (cinders and brick) and empty cavities. Solvents may have been disposed on this property.

The power plant had a lake on the property which was used for cooling water prior to the 1960's. Solvents may have been introduced to this pond and leached to the aquifer.

2. Several gas stations, car repair places, dry cleaning establishments and probably other sources are located within the drainage basin of the drainage ditch which flows by well 7.

3. A sewer line runs along the street south of well 7. This may be acting as a conduit for contaminants from other parts of town.
4. Railroad tracks run by well 7. A train derailment or spill may have caused the contamination.

NATURE OF HAZARDOUS MATERIAL

Tetrachloroethene is also known as perchloroethylene, perk, PCE, PERC, carbon disulfide, tetrachloroethylene and 1,1,2,2-tetrachloroethylene. *PCE*
WRONG
C12C = C1C12?
CARBON DI CHLORIDE

Solubility: 170 mg/l
Vapor Pressure: 0.19 Pascals at 20°C
In air at STP - 1 ppm = 6.78 mg/m³

Fate

PCE ^{vaporizes} easily and the major loss from water is through evaporation. It is expected to leach through soils of low (<0.1 percent) organic carbon content. Prolonged storage of PCE in light increases decomposition.

PCE can be carried up the food chain, however, it does not appear to bio-magnify or concentrate as it moves up the food chain. It is generally eliminated rapidly from aquatic organisms and does not appear to affect aquatic plants. The following limits apply to freshwater aquatic life: *plants.*

Acute toxicity	5,280 mg/l
Chronic toxicity	840 mg/l
Toxicity (humans)	Lifetime Health Advisory Level in drinking water is 608 ^{μg/l}
	Cancer Risk at 10 ⁻⁵ is 6.6 ^{μg/l}
In Air:	HRS Toxicity/Persistence Value is 12

5 ppm	odor threshold-smells like chloroform
75 ppm	very slight eye irritation
100 ppm	central nervous system depression

The NIOSH Standards are:

TWA	50 ppm
Ceiling	100 ppm

Neither of these ^{air} levels may provide adequate protection because they were selected to prevent toxic effects other than cancer.

Uses

The uses of PCE are: Dry cleaning solvent; textile scouring solvent; dried vegetable fumigant; rug and upholstery cleaner; stain, spot, lipstick and rust remover; paint remover; ^{printing} ink ingredient; heat transfer media ingredient; chemical intermediate in the production of other organic compounds and a metal degreaser.

Elevated levels of PCE were found in drinking water transported in vinyl coated asbestos-cement pipes. However, from information on the water supply permit, Atlantic does not have this kind of pipe.

Possible Affected Population and Resources

The latest sample results for the finished water showed tetrachloroethene at 1 ppb. The Atlantic Water Supply has 3009 service connections serving approximately 8,000 customers. Additionally some private wells in the area may potentially be effected.

The waste flow from well 7 presently discharges, without treatment, to Buttermilk Creek which flows to Troublesome Creek then to the Nishnabotna River about 1 1/2 miles downstream. The levels observed in the well water prior to discharge are about 1/4 of the chronic toxicity level for fresh water aquatic life (840 mg/l). Losses ~~are~~ likely^{are} through volatilization as the discharge splashes into the Creek. Buttermilk Creek is an intermittent stream (Drainage Ditch).

Conclusions and Recommendations

Conclusions

Well 7 of the Atlantic water supply is contaminated with tetrachloroethene and low levels of other chemicals. Well 3 has shown low levels of PCE. The water supply is presently able to meet its demand without these wells and has taken them off line. Well 7 is pumped continuously to waste. Contaminants have also been detected in wells 2,8,9 and 12. Except for well 2, these wells have not been retested since contamination was detected in 1984. The amount of PCE in the finished water was 1 ppb prior to taking well 3 off line.

The source of contamination has not been identified to date.

Recommendations

A site inspection should be performed with the following goals.

1. Determine which wells are presently contaminated. Wells 8,9 and 12 have not been tested since 1984 when contamination was detected and wells 4,6,10 and 11 have^{never} been tested. Ideally, all wells would be examined at one time. ^{for organics.}
2. Attempt to determine the source of contamination. EPA has agreed to assist us through their FIT. Because of the volatile nature of PCE, a soil gas survey may help to determine the source. However, due to the depth of clay near the site, a drill rig would probably be required for this type of investigation.

REFERENCES

IDNR Files

Atlantic Water Supply - File, Fische & film
Con 12-15 - Atlantic
Atlantic Water Use

Atlantic Water Supply Files:

Well Files and Well Operating Logs

Draft Health Assessment Document for Tetrachloroethylene EPA-600/8-82-005B
December, 1983

Handbook of Toxic and Hazardous Chemicals by Sitting, 1985.

Appendix Two

SAMPLE RESULTS:

Sample Synopsis

SAMPLE LOCATION	SAMPLE DATE	ORGANIC COMPOUND	CONCENTRATION (PPB)	SAMPLE TYPE*
Well #1	3-6-86	Trichloroethene	undetected <.2	TT
Well #1	3-6-86	Tetrachloroethene	undetected <.2	TT
Well #2	8-8-84	1,1 Dichloroethane	1	SOC
Well #2	8-8-84	Trichloroethene	Detected <1ppb	SOC
Well #2	3-6-86	Trichloroethene	undetected <.2	TT
Well #2	3-6-86	Tetrachloroethene	undetected <.2	TT
Well #3	8-8-84	Chloroform	Detected <1ppb	SOC
Well #3	8-8-84	1,2 Dichloroethane	Detected <1ppb	SOC
Well #3	8-8-84	Trichloroethene	Detected <1ppb	SOC
Well #3	8-8-84	Tetrachloroethene	2	SOC
Well #3	3-6-86	Trichloroethene	undetected <.2ppb	TT
Well #3	3-6-86	Tetrachloroethene	undetected <.2ppb	TT
Well #3	6-18-86	tetrachloro ethene	4	PP
Well #7	8-26-82	Tetrachloroethene	170	unknown
Well #7	8-8-84	Trans 1,2 Dichloroethene	Detected <1ppb	SOC
Well #7	8-8-84	Chloroform	Detected <1ppb	SOC
Well #7	8-8-84	Trichloroethene	2	SOC
Well #7	8-8-84	Tetrachloroethene	260	SOC

* PP- Priority Pollutants

SOC - Synthetic Organic Compounds

TT - Tetrachloroethene & Trichloroethene

SAMPLE LOCATION	SAMPLE DATE	ORGANIC COMPOUND	CONCENTRATION (PPB)	SAMPLE TYP
Well #7	8-8-84	Atrazine	1.7	SOC
Well #7	1-23-86	trichloroethene	1.1	TT
Well #7	1-23-86	tetrachloroethene	1900	TT
Well #7	3-6-86	trichloroethene	0.9	TT
Well #7	3-6-86	tetrachloroethene	160	TT
Well #7	6-18-86	trichloroethene	1	SOC
Well #7	6-18-86	tetrachloroethene	200	SOC
Finished Water	1-23-85	Chloroform	5	SOC
Finished Water	1-23-85	Brodichloromethane	12	SOC
Finished Water	1-23-85	Dibromochloromethane	28	SOC
Finished Water	1-23-85	Bromoform	10	SOC
Finished Water	3-6-86	trichloroethene	undetected <.2	TT
Finished Water	3-6-86	tetrachloroethene	undetected <.2	TT
Finished Water	6-18-86	Chloroform	3	SOC
Finished Water	6-18-86	Bromodichloromethane	5	SOC
Finished Water	6-18-86	Dibromochloromethane	5	SOC
Finished Water	6-18-86	Bromoform	1	SOC
Finished Water	6-18-86	Tetrachloroethene	1	SOC